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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/602,187	06/24/2003	Ross Cutler	302973.1	1028
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			<div>EXAMINER PETERSON, CHRISTOPHER K</div>	
			<div>ART UNIT 2622</div>	<div>PAPER NUMBER</div>
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/602,187

Applicant(s)

CUTLER, ROSS

Examiner

Christopher K. Peterson

Art Unit

2622

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22 and 29 is/are allowed.
- 6) ☒ Claim(s) 1-17, 19-21 and 23-28 is/are rejected.
- 7) ☒ Claim(s) 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 June 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 11/04/2007 have been fully considered but they are not persuasive.

First in regard to claims 1, 3, 15, and 25 (Section A of Remarks, pg 8), the applicant argues that Shigehiro (JP 08-108689) reference does not teach "wherein a boom is positioned above a whiteboard" (See Remarks pg 8). The Examiner respectfully disagrees. Specifically, noting the Shigehiro reference (Fig. 1) shows a boom positioned above a whiteboard. In paragraph 6 the Shigehiro reference teaches that figure 1 is a front view, figure 2 is a level view (top view) and figure 3 is a side view. While the Applicant contends that Shigehiro discloses a system for capturing images of an electronic blackboard that includes an electronic camera 4, a stroboscope 404 that illuminates the board and a control section 405 which carries out control of the electronic camera 4 as a whole (page 9 of the translation, Para 11). **Apparently a pivoted arm 3 moves the camera up and down the whiteboard to take images of the whiteboard in order to obtain an entire image of the board (FIG. 2).** As stated above the pivoted arm (3) moves the camera in a horizontal plane above the white board not in a vertical plane. In paragraph 8 Shigehiro further explains that the camera bearing bar (302) which it has so that it might rotate horizontally to this attachment section 301. Also in paragraph 8 Shigehiro teaches that the location of the electronic camera (4) at this time is located at the center top and able to read to the right and left

edge of a feltboard (1). For this reason, the Examiner believes that Shigehiro does teach the limitation "wherein a boom is positioned above a whiteboard" of claims 1, 5, 15, and 25 and the rejection to the claims will be set forth below.

Secondly in regard to claims 1, 3, 15, and 25 (Section A of Remarks, pg 9), the applicant argues that Shigehiro (JP 08-108689) reference does not teach "the camera is adjusted such that the tilt angle of the lens with respect to the sensor plane of the camera is zero to capture an in focus uniform resolution image of the entire whiteboard". The Examiner respectfully disagrees. Specifically, Shigehiro reference (Fig. 4) shows an image sensor (403) parallel to a lens (401) which is parallel to the white board (1) (Para 11). The Applicant contends that Shigehiro in FIG. 4, however, merely shows the components of the system. **The optical axis x as shown in FIG 4 would only cover the very top edge of the board, not the entire image.** The geometry of FIG. 4 clearly shows that the tilt angle of the lens with respect to the sensor plane cannot be zero to get a uniform resolution image of the entire whiteboard when the camera is mounted above the whiteboard. Applicant cites that Shigehiro does not teach the applicants' **claimed boom mounted above a whiteboard with a single view camera adjusted such that the tilt angle of the lens with respect to the sensor plane of the camera is zero so as to capture an in focus, uniform resolution image of the entire whiteboard.** As stated above Shigehiro reference (Fig. 4) shows an image sensor (403) parallel to a lens (401) which is parallel to the white board (1) (Para 11). In paragraph 11, Shigehiro teaches since the image read when this electronic camera 4 was leaning to the optical axis so that it might be suitable in the center of a feltboard (1)

is distorted, the feltboard (1) has been read towards the feltboard (1) top only using the lower half of the lens 401 so that it may become perpendicular to the flat surface of the feltboard (1) about an optical axis x. (last sentence in paragraph 11). Examiner reads this limitation as **SINCE** the image read when this electronic camera 4 was leaning (angled) to the optical axis so that it might be suitable in the center of a feltboard (1) is distorted (the edges were distorted), **(THEREFORE)** the feltboard (1) has been read towards the feltboard (1) top only using the lower half of the lens (401) so that it may become perpendicular to the flat surface of the feltboard (1) about an optical axis x. Looking at figure 4, Shigehiro shows that the x axis of the lens (401) is perpendicular to the bottom of the image sensor (403) and the bottom of the whiteboard is located at the top of the image sensor. For this reason, the Examiner believes that Shigehiro does teach the limitation **"adjusted such that the tilt angle of the lens with respect to the sensor plane of the camera is zero so as to capture an in focus, uniform resolution image of the entire whiteboard"** of claims 1, 5, 15, and 25 and the rejection to the claims will be set forth below.

Thirdly in regard to claims 1, 3, 15, and 25 (Section A of Remarks, pg 9), the applicant argues that Shigehiro (JP 08-108689) reference (Fig. 4) **does** show that the lens (401) and image sensor (403) are parallel. Applicant argues the optical axis x as shown in FIG 4 would only cover the very top edge of the board, not the entire image. The geometry of FIG. 4 clearly shows that the tilt angle of the lens with respect to the sensor plane cannot be zero to get a uniform resolution image of the entire whiteboard when the camera is mounted above the whiteboard (Section A of Remarks, pg 9). The

Examiner respectfully disagrees. Specifically, Shigehiro reference shows the lens (401) and image sensor (403) in parallel as applicant has agreed. Examiner agrees that the optical axis x of the lens is located at the top of the whiteboard. Looking at figure 3 of application, the top of the whiteboard (L) is located at the bottom of the image sensor (F). Applicant claims the tilt angle (α) of the **lens** with respect to the sensor plane (E (top of image sensor) and F (bottom of image sensor)) of the camera is zero, but the lens is never shown in any of the figures. For this reason, the Examiner believes that Shigehiro does teach the limitation **“adjusted such that the tilt angle of the lens with respect to the sensor plane of the camera is zero so as to capture an in focus, uniform resolution image of the entire whiteboard”** of claims 1, 5, 15, and 25 and the rejection to the claims will be set forth below. Examiner has also objected to figure 3 for not showing every feature of the invention specified in the claims.

First in regard to claims 2, 4, 7, 16, 17, 19 – 21, 26, and 27 (Section B of Remarks, pg 10 - 14), the applicant argues that Shigehiro (JP 08-108689) in view of Rodriguez (US Patent 6,179,426) reference do not teach **“a camera for capturing images of a whiteboard wherein the camera is mounted on a boom positioned above a whiteboard and adjusted such that the tilt angle of the lens with respect to the sensor plane of the camera is zero to capture an in focus uniform resolution image of the entire whiteboard”** (See Remarks pg 12). The Examiner respectfully disagrees. Specifically, noting the examiner’s explanations above in accordance with the Shigehiro reference. The Rodriguez reference was brought in to show that the camera’s focal length could be adjusted, a microphone, video

conferencing and table mounted. Rodriguez reference teaches a projection angle of approximately 22 degrees. Examiner fails to see how the projection angle of the camera has anything to do with the tilt angle of the lens to the image sensor. The claim language does not cite the whiteboard needs to be parallel to anything. For this reason, the Examiner believes that Shigehiro in view of Rodriguez do teach the limitation "**a camera for capturing images of a whiteboard wherein the camera is mounted on a boom positioned above a whiteboard and adjusted such that the tilt angle of the lens with respect to the sensor plane of the camera is zero to capture an in focus uniform resolution image of the entire whiteboard**" of claims 2, 4, 7, 16, 17, 19 – 21, 26, and 27 and the rejection to the claims will be set forth below. Examiner has also objected to figure 3 for not showing every feature of the invention specified in the claims.

First in regard to claims 5 - 6, 11 – 14, 23 and 24 (Section C of Remarks, pg 14 - 18), the applicant argues that Shigehiro (JP 08-108689) in view of Keenan (US Pub. 2004/0201698) reference do not teach "**a camera for capturing images of a whiteboard wherein a camera is mounted on a boom positioned above a whiteboard and adjusted such that the tilt angle of the lens with respect to the sensor plane of the camera is zero to capture an in focus uniform resolution image of the entire whiteboard**" (See Remarks pg 12). The Examiner respectfully disagrees. Specifically, noting the examiner's explanations above in accordance with the Shigehiro reference. The Keenan reference was brought in to show that the camera system comprises a computer to enhance the whiteboard image. Keenan reference

was not used to teach the limitation “a camera for capturing images of a whiteboard wherein a camera is mounted on a boom positioned above a whiteboard and adjusted such that the tilt angle of the lens with respect to the sensor plane of the camera is zero to capture an in focus uniform resolution image of the entire whiteboard”. Keenan does teach a camera mounted above a whiteboard and the tilt angle of the lens is parallel to the image sensor. Shigehiro was used to teach this limitation as stated above. For this reason, the Examiner believes that Shigehiro in view of Keenan do teach the limitation “a camera for capturing images of a whiteboard wherein the camera is mounted on a boom positioned above a whiteboard and adjusted such that the tilt angle of the lens with respect to the sensor plane of the camera is zero to capture an in focus uniform resolution image of the entire whiteboard” of claims 2, 4, 7, 16, 17, 19 – 21, 26, and 27 and the rejection to the claims will be set forth below. Examiner has also objected to figure 3 for not showing every feature of the invention specified in the claims.

Secondly in regard to claims 12 – 14 (Section C of Remarks, pg 18), the applicant argues the Official Notice take in regards to “white balancing, removing shadows, and segmenting” is not proper. Applicant agrees with white balancing maybe well known in the art, but removing shadows and segmenting are not well known in the art. Applicant requested for a reference that shows that removing shadows and segmenting are well known in the art. Examiner respectfully applies Martins (US Patent 6,671,419) reference to show that removal of shadows is well known in the art. The Martin reference teaches a method of reducing shadows and/or noise in a digital image

includes the following. A noise floor for the digital image is estimated. A threshold level for a difference image of the digital image and a background image is determined based, at least in part, on the noise floor estimate. The digital image is modified based, at least in part, on the determined threshold level and the difference image. The Martins (US Patent 6,771,834) reference to show segmenting is well known in the art. The Martin reference teaches a method of removing at least some noisy pixels internal to one or more objects in a digital image includes the following. A sequence of one or more morphological openings and/or closings is applied in gradually increasing size. Then, a morphological closing with reduced erosion is applied, the erosion having a size larger than any of the one or more morphological openings and/or closings in the sequence. For this reason, the Examiner believes the Official Notice taken in regards to "white balancing, removing shadows, and segmenting" is proper for claims 12 - 14 and the rejection to the claims will be set forth below.

First in regard to claims 8 - 10 (Section D of Remarks, pg 18 - 20), the applicant argues that Shigehiro (JP 08-108689) in view of Rodriguez (US Patent 6,179,426) further in view of Addeo (US Patent 5,335,011) references do not teach **"a camera for capturing images of a whiteboard wherein the camera is mounted on a boom positioned above a whiteboard and adjusted such that the tilt angle of the lens with respect to the sensor plane of the camera is zero to capture an in focus uniform resolution image of the entire whiteboard"** (See Remarks pg 12). The Examiner respectfully disagrees. Specifically, noting the examiner's explanations above in accordance with the Shigehiro and Rodriguez references. The Addeo reference was

brought in to reject the limitation of a microphone array and sound localizer. For this reason, the Examiner believes that Shigehiro in view of Rodriguez further in view of Addeo do teach the limitation **"a camera for capturing images of a whiteboard wherein the camera is mounted on a boom positioned above a whiteboard and adjusted such that the tilt angle of the lens with respect to the sensor plane of the camera is zero to capture an in focus uniform resolution image of the entire whiteboard"** of claims 8 – 10 and the rejection to the claims will be set forth below.

First in regard to claims 28 (Section E of Remarks, pg 20 - 22), the applicant argues that Shigehiro (JP 08-108689) in view of Rodriguez (US Patent 6,179,426) further in view of Branc (US Patent 6,122,865) references do not teach **"a camera for capturing images of a whiteboard wherein the camera is mounted on a boom positioned above a whiteboard and adjusted such that the tilt angle of the lens with respect to the sensor plane of the camera is zero to capture an in focus uniform resolution image of the entire whiteboard"** (See Remarks pg 20). The Examiner respectfully disagrees. Specifically, noting the examiner's explanations above in accordance with the Shigehiro and Rodriguez references. The Branc reference was brought in to reject the limitation of the camera mounted to a wall. For this reason, the Examiner believes that Shigehiro in view of Rodriguez further in view of Addeo do teach the limitation **"a camera for capturing images of a whiteboard wherein the camera is mounted on a boom positioned above a whiteboard and adjusted such that the tilt angle of the lens with respect to the sensor plane of the camera is zero to**

capture an in focus uniform resolution image of the entire whiteboard" of claims

28 and the rejection to the claims will be set forth below.

Claim Objections

2. Claim 1 objected to because of the following informalities:

Applicant cites "the tilt angle of the lens with respect to the sensor" (Claim 1).

Claim should read "**a** tilt angle of **a** lens with respect to **a** sensor" for clarity and precision purposes.

Applicant also cites "the camera" in claim 1 line 5, but in claim 1 line 4 cites "a single view camera". Claim should read "the **single view** camera" for clarity and precision purposes.

In claim 2, claim cites "said view camera". Claim should read "the **single view** camera" for clarity and precision purposes.

Examiner will analyze claim language "said camera" or "said view camera" to read "the **single view** camera" for clarity and precision purposes.

Appropriate correction is required.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the **lens** must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
5. **Claims 1, 3, 15, and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Shigehiro et al. (JP 08-108689).**

First, considering claim 1, the Shigehiro reference teaches a camera system for capturing images of a whiteboard comprising a boom (camera bearing bar 302) positioned above a whiteboard (feltboard 1), a single view camera (electronic camera 4) mounted to the distal end of the boom and adjusted such that the tilt angle of the lens (wide angle lens 401) with respect to the sensor plane (of CCD sensor 403) of the camera is zero (i.e. lens and sensor plane are parallel) so as to capture an in focus uniform resolution image of the entire whiteboard. Note in Fig. 4 that the plane of the wide angle lens (401) and the plane of the CCD sensor (403) are parallel to one another, and thus the tilt angle of the lens with respect to the sensor plane is zero. Further, Fig. 4 shows that the CCD sensor (403) captures an in focus uniform resolution image of the entire whiteboard (1) by using only the bottom half of wide angle lens (401) to eliminate the distortion of a "leaning" optical axis. Please refer further to Fig. 3, and Paras. [0007-0011].

As for claim 3, the limitations of claim 1 are taught above, and the Shigehiro reference further discloses that the system also comprises a mounting device (attachment section 301) for mounting the boom (302) to be positioned above the whiteboard. See Figs. 1 and 3, as well as Para. [0008].

Considering claim 15, the Shigehiro reference teaches a process for capturing images of a whiteboard comprising positioning a boom (camera bearing bar 302) above a whiteboard (feltboard 1), mounting a single view camera (electronic camera 4) to the distal end of the boom so as to capture images of a desired portion of the whiteboard, and adjusting the camera such that the tilt angle of the lens (wide angle lens 401) with

respect to the sensor plane (of CCD sensor 403) of the camera is zero (i.e. lens and sensor plane are parallel) before capturing the images so as to capture an in focus uniform resolution image of the entire whiteboard. Note in Fig. 4 that the plane of the wide angle lens (401) and the plane of the CCD sensor (403) are parallel to one another, and thus the tilt angle of the lens with respect to the sensor plane is zero. Further, Fig. 4 shows that the CCD sensor (403) captures an in focus uniform resolution image of the entire whiteboard (1) by using only the bottom half of wide angle lens (401) to eliminate the distortion of a "leaning" optical axis. Please refer further to Fig. 3, and Paras. [0007-0011].

Finally, considering claim 25, the Shigehiro reference teaches a camera system for capturing images of a whiteboard comprising a single view camera (electronic camera 4) positioned (on camera bearing bar 302) and adjusted such that the tilt angle of the lens (wide angle lens 401) with respect to the sensor plane (of CCD sensor 403) of the camera is zero (i.e. lens and sensor plane are parallel) so as to capture an in focus uniform resolution image of a whiteboard (feltboard 1). Note in Fig. 4 that the plane of the wide angle lens (401) and the plane of the CCD sensor (403) are parallel to one another, and thus the tilt angle of the lens with respect to the sensor plane is zero. Further, Fig. 4 shows that the CCD sensor (403) captures an in focus uniform resolution image of the entire whiteboard (1) by using only the bottom half of wide angle lens (401) to eliminate the distortion of a "leaning" optical axis. Please refer further to Fig. 3, and Paras. [0007-0011].

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 2, 4, 7, 16, 17, 19-21, 26, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shigehiro et al. (JP 08-108689) in view of Rodriguez, Jr. et al. (U.S. Pat. 6,179,426).

Next, considering claim 2, the limitations of claim 1 are taught above by Shigehiro, and the Shigehiro reference does teach that the single view camera (4) is positioned on the boom so as to cover the portion(s) of the whiteboard it is desired to capture as an image in Paras. [0007-0011]. What Shigehiro does not specifically teach is that the distance between the center of projection of the camera and the camera's sensing surface is adjusted to provide optimum focus. However, Rodriguez reference teaches a camera (756) that is adjusted so that the depth of field covers the desired portion of the whiteboard, the tilt angle is approximately parallel (22 degree angle) to the plane of the whiteboard, and the distance between the center of projection of the camera and the camera's sensing surface is adjusted to provide optimum focus (See Fig. 13, Col. 8, Lines 1-9, Col. 10, Lines 51-59, and Col. 13, Lines 8-27). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the boom and camera system having depth of field and focus adjustments, as taught by Rodriguez, with the boom and camera system of Shigehiro. One would have been motivated to do so because by adjusting the capture angles and

focus positions of the camera, the whiteboard image captured will be a high-resolution image with no unnecessary objects (e.g. a wall, control panel, etc.) being present in the final image viewed by the users.

Next, considering claim 4, the limitations of claim 3 are taught above by Shigehiro, and while Shigehiro does show that the mounting device does enable the boom to be positioned above the whiteboard in Figs. 1 and 3, Shigehiro does not explicitly teach that the mounting device mounts on a rail at the top portion of the whiteboard. However, referring to Fig. 3, of the Rodriguez reference, Rodriguez shows that a mounting device (hinge unit 110) is mounted on a rail at the top of the whiteboard (102), wherein the hinge unit 110 holds a boom (arm 108).

In regard to claim 7, the limitations of claim 1 are again taught above by Shigehiro, but Shigehiro does not disclose the use of a microphone device for capturing audio synchronized with each image captured by the view camera. However, the Rodriguez reference teaches a microphone (microphone 760) that captures audio synchronized to each image captured by the view camera (camera 756) to allow for videoconferencing or data conferencing (See Fig. 13 and Col. 13, Lines 8-27).

Considering claim 16, again the Shigehiro reference teaches the limitations of claim 15 above, but Shigehiro does not specifically disclose that the focal length that will provide uniform resolution and in-focus images of the whiteboard is computed, and that the camera's focal length is set to the computed focal length. However, the Rodriguez reference does show that the focal length is computed and the camera (and projector's) focal length is set to the computed focal length in Col. 10, Lines 42-59.

As for claim 17, again the limitations of claim 15 are taught above, and as is similarly disclosed with respect to claim 16, Shigehiro does not specifically disclose that the focal length that will provide uniform resolution and in-focus images of the whiteboard is computed, and that the camera's focal length is set to the computed focal length. However, the Rodriguez reference does show that the focal length is computed and the camera (and projector's) focal length is automatically set to the computed focal length in Col. 10, Lines 42-59.

Considering claim 19, the limitations of claim 15 are taught above by Shigehiro, but Shigehiro fails to disclose that the process includes sending the image to a server that broadcasts or records the images. However, the Rodriguez reference teaches in Col. 13, Lines 8-27 that captured image data is broadcast through a server (i.e. videoconferencing).

Regarding claim 20, the Shigehiro reference teaches the limitations of claim 15, but Shigehiro does not does not disclose the process of capturing audio synchronized with each image captured by the view camera. However, the Rodriguez reference teaches a microphone (microphone 760) that capture audio synchronized to each image captured by the view camera (camera 756) to allow for videoconferencing or data conferencing (See Fig. 13 and Col. 13, Lines 8-27).

Considering claim 21, the limitations & claim 20 are taught above by Shigehiro in view of Rodriguez, and the Rodriguez reference teaches in Col. 13, Lines 8-27 that synchronized audio is broadcast along with image data (i.e. videoconferencing).

In regard to claim 26, the limitations of claim 25 are taught above by the Shigehiro reference, and the Shigehiro reference does teach that the single view camera is positioned on the boom so as to cover the portion(s) of the whiteboard it is desired to capture as an image in Paras. [0007-0011]. What Shigehiro does not specifically teach is that the view camera is adjusted on the boom so that the camera's depth of field covers the desired portion(s) of the whiteboard, the tilt angle of the camera's sensing surface is approximately parallel to the plane of the whiteboard, and the distance between the center of projection of the camera and the camera's sensing surface is adjusted to provide optimum focus. However, the Rodriguez reference teaches a camera (756) that is adjusted so that the depth of field covers the desired portion of the whiteboard, the tilt angle is approximately parallel (22 degree angle) to the plane of the whiteboard, and the distance between the center of projection of the camera and the camera's sensing surface is adjusted to provide optimum focus (See Fig. 13, Col. 8, Lines 1-9, Col. 10, Lines 51-59, and Col. 13, Lines 8-27).

As for claim 27, again the limitations of claim 25 are taught above by the Shigehiro reference, but Shigehiro does not teach that the view camera is mounted on a table and positioned so as to have a view of the whiteboard. However, the Rodriguez reference shows in Fig. 2 that the view camera (or projector) can be mounted on a table and positioned so as to have a view of the whiteboard.

8. Claims 11 – 14, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shigehiro et al. (JP 08-108689) in view of Keenan et al. (U.S. Pub. 2004/0201698).

Regarding claim 11, the limitations of claim 1 are taught above by Shigehiro, and while Shigehiro does disclose that image enhancements to the whiteboard image can be made (via operation means 507, as taught in Para. [0012], Shigehiro does not specifically disclose that the system comprises a computer to enhance the whiteboard image. However, the Keenan reference teaches that the camera system comprises a computer (central processing unit 100) to enhance the whiteboard image. Please refer to Fig. 5 and Paras. [0050-0052]. However, noting the Keenan reference, Keenan teaches that the mounting device (wall mount 50) mounts on a surface above the surface of the whiteboard is mounted. Note in Fig. 1 and Para. [0044] that the boom and wall mount are mounted on the wall above the midpoint of the whiteboard. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated mounting the mounting device above the surface of the whiteboard, as taught by Keenan, with the mounting device of Shigehiro. One would have been motivated to do so because, as Shigehiro teaches in Para. [0009], it is advantageous for the boom to be mounted above the whiteboard (or feltboard) so as to prevent the user from contacting the boom or camera when using the whiteboard, and thus mounting the boom to a mounting device above the surface of the whiteboard would ensure that the user does not contact the boom when the system is in use.

In regard to claims 12-14, Shigehiro in view of Keenan teaches the limitations of claim 11 above, and Keenan further discloses in Para. [0052] that the CPU 100 processes the captured image to ensure that only high contrast color pen strokes appear in the image. What Keenan does not specifically teach is that the CPU enhances the whiteboard image by white-balancing the image of the whiteboard to provide an image of the whiteboard with uniform white background color, removing shadows on the whiteboard in the image, and by segmenting non-whiteboard objects from the image of the whiteboard. However, Official Notice is taken that white-balancing, shadow removal, and segmenting non-target objects is common and well-known in the art. One would have been motivated to include such processing features in the CPU processing of Keenan so as to allow for only the high contrast color pen strokes on the white background to be viewable in the image presented to the user or users, thereby negating many undesirable defects and objects in the captured image. Further, as the Applicant has failed to properly traverse the Official Notice taken by the Examiner in the previous office action, the limitations of claims 12-14 are hereby considered to be Admitted Prior Art (See Martins (US Patent 6,671,419) reference to show that removal of shadows and Martins (US Patent 6,771,834) reference to show segmenting are well known in the art).

In regard to claim 23, the Shigehiro reference teaches a process for capturing images of a whiteboard comprising positioning a boom (camera bearing bar 302) above a whiteboard (feltboard 1), mounting a single view camera (electronic camera 4) to the distal end of the boom so as to capture images of a desired portion of the whiteboard,

and adjusting the camera such that the tilt angle of the lens (wide angle lens 401) with respect to the sensor plane (of CCD sensor 403) of the camera is zero (i.e. lens and sensor plane are parallel) before capturing the images so as to capture an in focus uniform resolution image of the entire whiteboard. Note in Fig. 4 that the plane of the wide angle lens (401) and the plane of the CCD sensor (403) are parallel to one another, and thus the tilt angle of the lens with respect to the sensor plane is zero. Further, Fig. 4 shows that the CCD sensor (403) captures an in focus uniform resolution image of the entire whiteboard (I) by using only the bottom half of wide angle lens (401) to eliminate the distortion of a "leaning" optical axis. Please refer further to Fig. 3, and Paras. [0007-0011].

What Shigehiro does not specifically teach is that more than one single view camera can be mounted and adjusted to capture a uniform resolution, in focus image of the entire whiteboard. However, the Keenan reference discloses a process of capturing images of a whiteboard, in this instance from multiple vantage points, comprising positioning more than one view camera (cameras 70a-70c) at a fixed distance (the length of the elongated boom 52) from a whiteboard so as to view the whiteboard, and adjusting each of the view cameras so as to capture images of the whiteboard. See Figs. 1 and 2, Paras. [0043-0046], and Para. [0063]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the use of more than one camera to capture images of the whiteboard, as done by Keenan, with the capturing of in focus uniform resolution whiteboard images, as done by Shigehiro. One would have been motivated to do so because in using more than one

camera to capture whiteboard images, the user is able to ensure the capture of an image having an unobstructed view with a uniform resolution.

Regarding claim 24, the limitations of claim 23 are taught above, and Keenan further teaches that the images are simultaneously captured with each of the view cameras (70a-70c) and that an image that provides an unobstructed view of the whiteboard is selected from among the simultaneously captured images. Please refer to Para. [0046]

9. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shigehiro et al. (JP 08-108689) in view of Rodriguez, Jr. et al. (U.S. Pat. 6,179,426) as applied to claim 4 above, and further in view of Keenan et al. (U.S. Pub. 2004/0201698).

Next, considering claim 5, the limitations of claim 3 are taught above by Shigehiro in view of Rodriguez, and while Shigehiro in view of Rodriguez does show that the mounting device does enable the boom to be positioned above the whiteboard in Figs. 1 and 3, Shigehiro in view of Rodriguez does not explicitly teach that the mounting device mounts on a surface above the surface the whiteboard is mounted to. However, noting the Keenan reference, Keenan teaches that the mounting device (wall mount 50) mounts on a surface above the surface of the whiteboard is mounted. Note in Fig. 1 and Para. [0044] that the boom and wall mount are mounted on the wall above the midpoint of the whiteboard. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated mounting the mounting

device above the surface of the whiteboard, as taught by Keenan, with the mounting device of Shigehiro in view of Rodriguez. One would have been motivated to do so because, as Shigehiro teaches in Para. [0009], it is advantageous for the boom to be mounted above the whiteboard (or feltboard) so as to prevent the user from contacting the boom or camera when using the whiteboard, and thus mounting the boom to a mounting device above the surface of the whiteboard would ensure that the user does not contact the boom when the system is in use.

As for claim 6, again the limitations of claim 3 are taught above, and Keenan further discloses that more than one type of device for mounting the boom to be positioned above the whiteboard, and wherein the types of devices for mounting the boom to be positioned above the whiteboard are interchangeable. See Figs. 2 and 8, Para. [0045], and Paras. [0060-0061].

10. Claim 8, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shigehiro et al. (JP 08-108689) in view of Rodriguez, Jr. et al. (U.S. Pat. 6,179,426) as applied to claim 7 above, and further in view of Addeo et al. (U.S. Pat. 5,335,011).

Next, considering claim 8, Shigehiro in view of Rodriguez teaches the limitations of claim 7; but the combination does not specifically disclose that the microphone device (760) is a microphone array. However, the Addeo reference teaches a teleconferencing system (including video cameras and microphones) using a microphone array (microphone array 150), as shown in Fig. 2 and Col. 4, Lines 40- 65. It would have been

obvious to one of ordinary skill in the art at the time the invention was made to have included the microphone array of Addeo with the microphone device of Shigehiro in view of Rodriguez. One would have been motivated to do so because by using a plurality of microphones in a microphone array configuration, only noise from the direction of the speaker or presenter will be picked up, thereby eliminating ambient noise, room reverberation, and acoustic coupling, as Addeo teaches in Col. 3, Lines 20-26.

As for claim 9, the limitations of claim 8 are disclosed above, and the Addeo reference further teaches that the audio captured by the microphone array (150) is used for sound source localization, as taught in Col. 4, Line 60 - Col. 5, Line 13.

In regard to claim 10, again the limitations of claim 7 are taught by Shigehiro in view of Rodriguez, but the combination does not specifically teach that the microphone device is used to improve the sound quality of a speaker by filtering sound from only the direction of the speaker. However, the Addeo reference teaches a microphone device (microphone array 150) that improves the sound quality of a speaker by filtering sound from only the direction of the speaker, as again taught in Col. 4, Line 60 - Col. 5, Line 13.

11. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shigehiro et al. (JP 08-108689) in view of Rodriguez, Jr. et al. (U.S. Pat. 6,179,426) as applied to claim 27 above, and further in view of Branc et al. (U.S. Pat 6,122,865).

Finally, regarding claim 28, Shigehiro in view of Rodriguez teaches the limitations of claim 27 above, but the combination does not teach that the view camera is mounted on a wall and positioned so as to have a view of the whiteboard. However, the Branc reference discloses a camera (40) mounted on a wall (third side wall partition 34) and positioned so as to have a view of the whiteboard (display screen 20 and interior screen surface 21), as is taught in Col. 6, Lines 8-30 and Fig. 3. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the camera mounted on a wall, as taught by Branc, with the camera system of Shigehiro in view of Rodriguez. One would have been motivated to do so because by mounting the camera on a wall, the camera's field of view will less likely be blocked completely by a presenter, as may happen with a camera mounted on a table, thereby enabling the camera to capture more useful images. Further, mounting the camera on the wall is an efficient use of available space.

Allowable Subject Matter

Claim 22 and 29 are allowed.

Claim 18 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding both claims 18 and 22, the prior art was not found to teach or reasonably suggest the limitation that the focal length is computed by inputting the various

parameters of the whiteboard, the distance between the whiteboard and the center of projection of the camera, the height of the image sensor, and the vertical distance between the center of projection of the camera and the top of the whiteboard (along with the tilt angle of the image sensor), into the claimed equation to determine focal length. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher K. Peterson whose telephone number is

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571-270-1704. The examiner can normally be reached on Monday - Friday 6:30 - 4:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NgocYen Vu can be reached on 571-272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CKP / JM
15 January 2008


NGOC-YEN VU
SUPERVISORY PATENT EXAMINER